

Amendments to the Claims:

Please cancel claims 1 to 18 as presented in the underlying International Application No. PCT/EP2003/010511 without prejudice.

Please add new claims 19-36, as indicated in the listing of claims below.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 to 18 (cancelled).

Claim 19 (new):        A method for determining effects of cycle time limitations for sub-processes of a production process for individual units of a technical product, in which are set: a pre-selected definition of the order of sequence in which the sub-processes of the production process are carried out, a pre-selected planned cycle time through the production process, a pre-selected random sample including individual sample elements of units processed in the production process, each one of the individual sample elements including information on actual cycle times of the corresponding unit through the sub-processes, and a pre-selected maximum cycle time through a pre-selected one of the sub-processes, the method comprising the steps of:

for all individual sample elements, replacing the actual corresponding cycle times through the pre-selected one of the sub-processes with pre-selected reduced cycle times set to be equal to or less than the pre-selected maximum cycle time for the pre-selected one of the sub-processes,

determining cycle times through the production process, which result from the reduction, for the random sample, using

the reduced cycle times for the individual sample elements of the random sample

through the pre-selected one of the sub-processes,

the actual cycle times of the individual sample elements of the random sample through the remaining sub-processes, and

the order of sequence,

determining a degree of delivery reliability of the production process as a proportion of sample elements of the random sample having cycle times that are less than or equal to the planned cycle time through the production process.

Claim 20 (new):       The method of claim 19, comprising the further steps of :

determining a degree of delivery reliability function to indicate the degree of delivery reliability as a function of the planned cycle time; and

determining a planned cycle time and a degree of delivery reliability by selecting an operating point of the degree of delivery reliability function.

Claim 21 (new):       The method of claim 20, comprising the further step of selecting a point at which a slope of a curve of the degree of delivery reliability function is approximately 45 degrees as the operating point.

Claim 22 (new):       The method of claim 19, comprising the further steps of:

specifying a lower bound for the degree of delivery reliability of the production process,

performing the method steps of claim 19 at each of different pre-selected planned cycle times, and

determining the planned cycle times resulting in degrees of delivery reliability greater

than or equal to the lower bound.

Claim 23 (new):       The method of claim 22 comprising the further steps of:

          determining an average of the cycle times through the production process,

          determining an average storage duration as the difference between the pre-selected planned cycle time and the average cycle time through the production process.

Claim 24 (new):       The method of claim 23, comprising the further steps of:

          specifying an average number of units of the technical product which are to be produced by the production process, and

          determining an average inventory of units as a function of the average number to be produced and the determined average storage duration.

Claim 25 (new):       The method of claim 24, comprising the further steps of:

          determining a storage duration function indicating the average storage duration as a function of the pre-selected planned cycle time;

          repeating the method of claim 24 at different pre-selected planned cycle times during the determination of the previous step.

Claim 26 (new):       The method of claim 24, comprising the further steps of:

          determining an inventory function to indicate an average inventory as a function of the pre-selected planned cycle time;

repeating the method of claim 24 at different pre-selected planned cycle times during the determination of the previous step.

Claim 27 (new):       The method of claim 25, comprising the further steps of:

specifying an upper bound for an average storage duration, and

varying the pre-selected planned cycle time, to determine planned cycle times resulting in storage durations of less than or equal to the upper bound.

Claim 28 (new):       The method of claim 19, comprising the further steps of:

determining a reduction factor of less than 1 for the cycle time through the pre-selected sub-process ; and

determining reduced cycle times as the product of the reduction factor and the actual cycle times of sample elements through the pre-selected sub-process .

Claim 29 (new):       The method of claim 19, comprising the further steps of:

specifying a reduction factor of less than 1 for the cycle time through the pre-selected sub-process ; and

determining a maximum cycle time as the product of the reduction factor and the maximum actual cycle time through the pre-selected sub-process among the sample elements.

Claim 30 (new):       A device arrangement for determining effects of cycle time limitations for sub-processes of a repeatable production process for individual units of a technical product, which comprises:

a first device for defining an order of sequence in which sub-processes of the production process are carried out,

a second device for defining a planned cycle time through the production process,

a third device for defining a maximum cycle time through at least one first sub-process,

a fourth device for determining a random sample for the production process, the random sample including a cycle time through each sub-process for each sample element of the random sample,

a fifth device for reducing the cycle times through the first sub-process in all sample elements to a value less than or equal to the maximum cycle time for the first sub-process,

a sixth device for determining cycle times through the production process for the random sample, using the reduced cycle times for the first sub-process, the actual cycle times for the remaining sub-processes, and the order of sequence, and

a seventh device for determining a degree of delivery reliability as a proportion of sample elements of the entire random sample whose cycle times are less than or equal to the planned cycle time through the production process.

Claim 31 (new):       The device of claim 30, further comprising:

an eighth device for determining an average cycle time through the production process,  
and

a ninth device for determining an average storage duration as a difference between the planned cycle time and the average cycle time.

Claim 32 (new):       The device of claim 30, further comprising:

a tenth device for determining, by varying the planned cycle time, a degree of delivery reliability function to indicate a degree of delivery reliability as a function of the planned cycle time, and

an eleventh device for generating a graphical representation of the degree of delivery reliability function.

Claim 33 (new):       The device of claim 32, further comprising:

a twelfth device for defining a plurality of combinations of maximum cycle times for sub-processes; each combination including at least one upper bound for the cycle time through a sub-process, and

a fourteenth device for generating a graphical representation of the degree of delivery reliability function for each defined combination.

Claim 34 (new):       The device of claim 33, further comprising:

a fifteenth device for determining, by varying the planned cycle time, a storage duration function for each defined combination, the storage duration function indicating the average storage duration as a function of the planned cycle time for a corresponding combination, and

a sixteenth device for generating a graphical representation of the storage duration function for the combinations.

Claim 35 (new):       A computer program product arranged and configured to be loaded into an internal memory of a computer and which includes software segments for implementing, when the product is running on the computer, a method for determining effects of cycle time limitations for sub-processes of a production process for individual units of a technical product,

in which are set: a pre-selected definition of the order of sequence in which the sub-processes of the production process are carried out, a pre-selected planned cycle time through the production process, a pre-selected random sample including individual sample elements of units processed in the production process, each one of the individual sample elements including information on actual cycle times of the corresponding unit through the sub-processes, and a pre-selected maximum cycle time through a pre-selected one of the sub-processes, the method comprising the steps of:

for all individual sample elements, replacing the actual corresponding cycle times through the pre-selected one of the sub-processes with pre-selected reduced cycle times set to be equal to or less than the pre-selected maximum cycle time for the pre-selected one of the sub-processes,

determining cycle times through the production process, which result from the reduction, for the random sample, using

the reduced cycle times for the individual sample elements of the random sample through the pre-selected one of the sub-processes,

the actual cycle times of the individual sample elements of the random sample through the remaining sub-processes, and

the order of sequence,

determining a degree of delivery reliability of the production process as a proportion of sample elements of the random sample having cycle times that are less than or equal to the planned cycle time through the production process.

Claim 36 (new): A computer program product stored on a computer-readable medium and including a computer readable program arranged and configured to cause a computer to execute a method for determining effects of cycle time limitations for sub-processes of a production process for individual units of a technical product, in which are set: a pre-selected definition of

the order of sequence in which the sub-processes of the production process are carried out, a pre-selected planned cycle time through the production process, a pre-selected random sample including individual sample elements of units processed in the production process, each one of the individual sample elements including information on actual cycle times of the corresponding unit through the sub-processes, and a pre-selected maximum cycle time through a pre-selected one of the sub-processes, the method comprising the steps of:

for all individual sample elements, replacing the actual corresponding cycle times through the pre-selected one of the sub-processes with pre-selected reduced cycle times set to be equal to or less than the pre-selected maximum cycle time for the pre-selected one of the sub-processes,

determining cycle times through the production process, which result from the reduction, for the random sample, using

the reduced cycle times for the individual sample elements of the random sample through the pre-selected one of the sub-processes,

the actual cycle times of the individual sample elements of the random sample through the remaining sub-processes, and

the order of sequence,

determining a degree of delivery reliability of the production process as a proportion of sample elements of the random sample having cycle times that are less than or equal to the planned cycle time through the production process.